REMARKS

PENDING OBJECTIONS TO THE SPECIFICATION

The specification is objected to under 37 CFR 1.71 because the Examiner contends that the specification does not describe in sufficient detail the monomers and polymers disclosed therein. The Applicant respectfully disagrees.

The description of Figure 9 states the following:

"Fig. 9 is a graph of a cure component study of viafill formulation primary resins. Component #1 is a trimer of bis 3,4 epocycyclohexylmethyladipate; Component #2 is the oxaxolidinone formed from the rearranged adduct of 1,1 bis(4-cyanatophenyl) ethane and bisepoxycyclohexylmethyl adipate; Component #3 is a combination oxazolidinone and isocyanurate product derived from the rearranged adduct of 1,1 bis(4-cyanatophenyl) ethane bisepoxycyclohexyl-methyl adipate; and Component #4 is the isocyanurate formed from the rearranged adduct of 1,1 bis(4-cyanatophenyl) ethane bisepoxycyclohexylmethyl adipate."

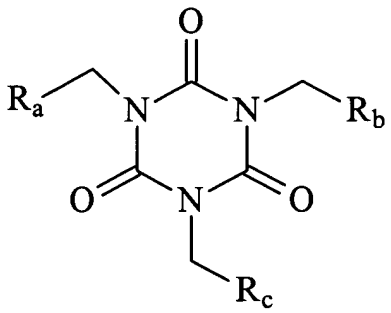
The description of Figure 13 states the following:

"Fig. 13 is a graph showing several novel formulations versus a 1000 cycle intercept as a function of a cohesive interface (polymer/ polymer interface). A is the product between trihydroxyethylisocyanurate and trisepoxypropyl isocyanurate; B is the product between trisepoxypropyl isocyanurate and oxydianiline; C is the product between trisepoxypropyl isocyanurate and bisphenol A epoxy; D is the product between trisepoxypropyl isocyanurate and oxybiscyclopentene oxide; E is the product between trihydroxyethylisocyanurate and trihydroxyethylisocyanurate; and F is the product between oxybiscyclopentene oxide and bisphenol A epoxy."

These descriptions do provide starting materials and reaction materials.

In the Detailed Description Section on pages 7-8, it states the following:

"**Components found in <u>electronic devices</u>** may comprise one or more types of polymers depending on the type of polymer application required in the device. **<u>A preferred electronic device</u>** includes a component or components comprising a polymer having in whole or in part a monomer of the formula:



wherein R_a, R_b, R_c comprises a hydroxylated aliphatic side chain; an epoxy glycol; an ethoxy ether; a glycol ether; an adduct of glycol ether and a bisphenol glycol epoxy; an adduct of an epoxy glycol and an amine such as oxydianiline to form a hydroxylamine; an adduct of a glycol ether and a cycloaliphatic epoxy such as oxybiscyclopentene oxide; an adduct of hydroxyethyl side chain and a cycloaliphatic epoxy such as oxybiscylopentene." (emphasis added)

This section of the description points out that these are components of electronic devices.

The definition of monomer states that: "As used herein, the term "monomer" refers to any chemical compound that is capable of forming a covalent bond with itself or a chemically different compound in a repetitive manner. The repetitive bond formation between monomers may lead to a linear, branched, super-branched, or three-dimensional product." Covalent bonds are described in this definition and one of ordinary skill in the art of basic chemistry understands what the phrase "covalent bond" comprises.

Page 14 of the current specification states:

"Suitable materials that may be used to form the polymer and/or the substrate includes any

chemical precursors, solvents, gases, and/or compounds that the researcher needs to construct the polymer or substrate. **Contemplated chemical precursors include tris(2,3-epoxyproply)isocyanurate; 1,3,5 tris(2-hydroxyethyl)1,3,5,triazine2,4,6 t(1H,3H,5H) trione; bis(2,3 epoxycyclopentyl ether); 4,4'oxydianiline; bisphenol A glycidyl ether; bis(3,4epoxycylohexylmethyl)adipate.**" (emphasis added)

Page 19 and 20 in the Examples Section states:

"An example of using the modeling results to affect formulation development can be found by referring to **Figure 3 and 4** above. Modeling indicated that a good mix of survivability for the cohesive, copper adhesive and glass adhesive interfaces might be found with resin B. Experimental tests indicated that B had better interfacial qualities and was been selected for further study in applications. For instance, the B was used in a formulation which made use of both B and rearranged cross products of B and a cyanate ester. **This formulation was tuned for a viafill application (the JM3200 series) and Figure 9 shows the stress-cycling results of the four major cure components and their predicted cycling abilities.** Using stress cycling analysis as well as adhesion analysis, the catalysis of this formulation was adjusted to try to maximize of best performing cure components (components 1 and 2) and to minimize the worst (components 3 and 4)." (emphasis added)

Clearly, based on this section in the Examples, the researcher, at the time the invention was made, knew of and understood the chemistry described herein. If the Examiner continues to maintain this objection, the Applicant will provide a Declaration by Nancy Iwamoto showing that these compounds were being produced at the time this invention was made and that one of ordinary skill in the art could have made these same compounds armed with a knowledge of polymer chemistry and this disclosure.

35 USC §112

Claims 40-42, 44-46, 48-51 and 53-57 are rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Applicant respectfully disagrees. "Interpretation B", as the Examiner labels it, is the proper and intended meaning of "high adhesive strain". Pages 16 and 17, of the original specification, along with the articles submitted by Nancy Iwamoto through the Information Disclosure System, show an Example of adhesive strain and what the parameters are for a high adhesive strain.

CLAIM OBJECTIONS

Claims 49-51 and 53-57 are objected to based on certain informalities. Claim 49 is herein amended and the Applicant believes that this amendment addresses the Examiner's objection.

35 USC §§102/103

Claims 40-42, 44-46, 48-51 and 53-57 are rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Watanabe et al. (US Patent No.: 3932689). The Applicant respectfully disagrees.

Claim 40 of the present application recites: "An electronic component, comprising: a candidate substrate; and a candidate polymer, wherein the candidate polymer comprises a high adhesive strain component with respect to the candidate substrate; wherein the candidate substrate and the candidate polymer are coupled to one another to form an interface, and wherein the substrate and the polymer are selected as candidates based on a software program."

Claim 49 of the present application recites: "An electronic component, comprising: a candidate substrate; a candidate first polymer; and a candidate second polymer, wherein the candidate first polymer comprises a high adhesive strain component with respect to the candidate substrate and the candidate second polymer and wherein the candidate second polymer comprises a high adhesive strain component with respect to the candidate first polymer; wherein the candidate first polymer and the candidate second polymer are coupled to one another to form an interface, and wherein first polymer and the second polymer are selected as candidates based on a software program, and wherein one of the candidate first polymer or the candidate second polymer is coupled to the candidate substrate."

The Applicant first disagrees with the Examiner's interpretation of the claims. The determination of a high adhesive strain is exhibited and shown in the Examples section of the application, along with several of Nancy Iwamoto's articles submitted as Information Disclosure Statements during prosecution. The Applicant believes that utilizing a computer model and computer modeling software **prior** to laboratory experimentation with actual polymers and interfaces greatly reduces the costs required and greatly enhances the researcher's time - meaning that

researchers do not have to use trial and error as an experimental procedure in finding those components with high adhesive strain.

In claims 40 and 49, the substrates and polymers are "candidate" substrate and polymers, wherein the candidate polymer(s) have high adhesive strain components with respect to the candidate substrate or the candidate polymer. In addition, the candidates are selected as candidates based on a software program. However, it is important to note that the candidate polymers have particular characteristics with respect to the particular substrate or polymer - which is the degree of adhesive strain based on strain cycling information - that contributes to how those materials are chosen to be incorporated into the electronic component. Example 1, pages 16 and 17, of the present specification discusses the concepts of adhesive strain components and strain cycling and how these concepts are utilized to maximize the adhesion between substrates and polymers. The concept of adhesive strain components with respect to the candidate substrate, candidate polymer, candidate first polymer or candidate second polymer are not product-by-process limitations in the present application. An adhesive strain component would be similar to any physical characteristic of a material with respect to or in combination with another material, such as a melting point, a boiling point or a vaporization point.

Watanabe discloses adhesive components, however, Watanabe does not disclose that an adhesive strain component or strain intercepts are taken into account **before** pairing actual substrates with their most compatible actual polymers to form interfaces. Watanabe also indicates in the Comparative Examples section that the test of adhesion was based on reaction with a solvent, not strain cycling data or adhesive strain characteristics. Pairing a substrate with a polymer without knowledge and utilization of the adhesive relationship between the two **before pairing** is one of the detrimental situations that the present application addresses. The present application shows how an electronic component can be assembled in an analytical and deliberate manner. The teachings of Watanabe do not disclose to one of ordinary skill in the art the concepts of adhesive strain components and strain cycling/strain intercepts and how to use these concepts to put together an efficient electronic component. In addition, Watanabe does not suggest or motivate one of ordinary

skill in the art to produce an electronic component by taking into account the adhesive strain components of a polymer with respect to a substrate.

Also, Watanabe does not anticipate claims 40 or 49 of the present application. "Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W. L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundscriber Corp. v. United States*, 360 F.2d 954, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)) Further, the prior art reference must disclose each element of the claimed invention "**arranged as in the claim**". *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). Watanabe does not disclose that an electronic component comprises a candidate substrate; and a candidate polymer, wherein the candidate polymer comprises a high adhesive strain component with respect to the candidate substrate; wherein the candidate substrate and the candidate polymer are coupled to one another to form an interface, and wherein the substrate and the polymer **are selected as candidates based on a software program**. Watanabe also does not disclose an electronic component that comprises a candidate substrate; a candidate first polymer; and a candidate second polymer, wherein the candidate first polymer comprises a high adhesive strain component with respect to the candidate substrate and the candidate second polymer and wherein the candidate second polymer comprises a high adhesive strain component with respect to the candidate first polymer; wherein the candidate first polymer and the candidate second polymer are coupled to one another to form an interface, and wherein first polymer and the second polymer are selected as candidates based on a software program, and wherein one of the candidate first polymer or the candidate second polymer is coupled to the candidate substrate.

The Applicant also strongly disagrees with the Examiner's contention that the software program and related analysis merely indicates a product by process. As described earlier, it is a significant cost savings and time savings to the researchers and related companies to be able to computer model interfaces and suggest candidate polymers and/or candidate interfaces before actual

experimentation begins. You are not merely achieving the same result by using the software program and related analysis as seen in the cited art, but you are actually able to improve on those techniques by minimizing or eliminating experimental trial and error with actual polymers, substrates and interfaces.

Therefore, claims 40 and 49 of the present application are allowable over and in view of Watanabe. In addition, claims 41-42, 44-46, 48, 50-51 and 53-57 are allowable over and in view of Watanabe by virtue of their dependency on claims 40 and 49, respectively.

Claims 40-42, 44-46, 48-51 and 53-57 are rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Taniguchi et al. (US Patent No.: 5162140) in view of Asai et al (US 4345959). The Applicant respectfully disagrees.

Claim 40 of the present application recites: "An electronic component, comprising: a candidate substrate; and a candidate polymer, wherein the candidate polymer comprises a high adhesive strain component with respect to the candidate substrate; wherein the candidate substrate and the candidate polymer are coupled to one another to form an interface, and wherein the substrate and the polymer are selected as candidates based on a software program."

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The Applicant first disagrees with the Examiner's interpretation of the claims. The determination of a high adhesive strain is exhibited and shown in the Examples section of the application, along with several of Nancy Iwamoto's articles submitted as Information Disclosure Statements during prosecution. The Applicant believes that utilizing a computer model and computer modeling software **prior** to laboratory experimentation with actual polymers and interfaces greatly reduces the costs required and greatly enhances the researcher's time - meaning that researchers do not have to use trial and error as an experimental procedure in finding those components with high adhesive strain.

In claims 40 and 49, the substrates and polymers are "candidate" substrate and polymers, wherein the candidate polymer(s) have high adhesive strain components with respect to the candidate substrate or the candidate polymer. In addition, the candidates are selected as candidates based on a software program. However, it is important to note that the candidate polymers have particular characteristics with respect to the particular substrate or polymer - which is the degree of adhesive strain based on strain cycling information - that contributes to how those materials are chosen to be incorporated into the electronic component. Example 1, pages 16 and 17, of the present specification discusses the concepts of adhesive strain components and strain cycling and how these concepts are utilized to maximize the adhesion between substrates and polymers. The concept of adhesive strain components with respect to the candidate substrate, candidate polymer, candidate first polymer or candidate second polymer are not product-by-process limitations in the present application. An adhesive strain component would be similar to any physical characteristic of a material with respect to or in combination with another material, such as a melting point, a boiling point or a vaporization point.

Taniguchi discloses adhesive components, however like Watanabe, Taniguchi does not disclose that an adhesive strain component or strain intercepts are taken into account **before** pairing actual substrates with their most compatible actual polymers to form interfaces. Taniguchi also indicates in the Examples section that adhesion (after pairing) was found to be superior. Pairing a substrate with a polymer without knowledge and utilization of the adhesive relationship between the

two **before pairing** is one of the detrimental situations that the present application addresses. The present application shows how an electronic component can be assembled in an analytical and deliberate manner. The teachings of Taniguchi do not disclose to one of ordinary skill in the art the concepts of adhesive strain components and strain cycling/strain intercepts and how to use these concepts to put together an efficient electronic component. In addition, Taniguchi does not suggest or motivate one of ordinary skill in the art to produce an electronic component by taking into account the adhesive strain components of a polymer with respect to a substrate.

Also, Taniguchi does not anticipate claims 40 or 49 of the present application. "Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W. L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundscriber Corp. v. United States*, 360 F.2d 954, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)) Further, the prior art reference must disclose each element of the claimed invention "**arranged as in the claim**". *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). Taniguchi does not disclose that an electronic component comprises a candidate substrate; and a candidate polymer, wherein the candidate polymer comprises a high adhesive strain component with respect to the candidate substrate; wherein the candidate substrate and the candidate polymer are coupled to one another to form an interface, and wherein the substrate and the polymer **are selected as candidates based on a software program**. Taniguchi also does not disclose an electronic component that comprises a candidate substrate; a candidate first polymer; and a candidate second polymer, wherein the candidate first polymer comprises a high adhesive strain component with respect to the candidate substrate and the candidate second polymer and wherein the candidate second polymer comprises a high adhesive strain component with respect to the candidate first polymer; wherein the candidate first polymer and the candidate second polymer are coupled to one another to form an interface, and wherein first polymer and the second polymer are selected as candidates based on a software program, and wherein one of the candidate first polymer or the candidate second polymer is coupled to the candidate substrate.

The Applicant also strongly disagrees with the Examiner's contention that the software program and related analysis merely indicates a product by process. As described earlier, it is a significant cost savings and time savings to the researchers and related companies to be able to computer model interfaces and suggest candidate polymers and/or candidate interfaces before actual experimentation begins. You are not merely achieving the same result by using the software program and related analysis as seen in the cited art, but you are actually able to improve on those techniques by minimizing or eliminating experimental trial and error with actual polymers, substrates and interfaces.

Therefore, claims 40 and 49 of the present application are allowable over and in view of Taniguchi in view of Asai (showing Epikote 828). In addition, claims 41-42, 44-46, 48, 50-51 and 53-57 are allowable over and in view of Taniguchi in view of Asai by virtue of their dependency on claims 40 and 49, respectively.

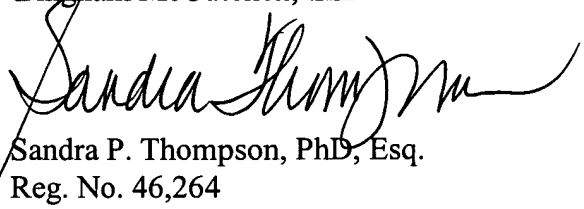
REQUEST FOR ALLOWANCE & TELECONFERENCE

Claims 40-42, 44-46, 48-51 and 53-57 are pending in this application, and the Applicant respectfully requests that the Examiner reconsider these claims in light of the arguments presented and allow all pending claims. The Applicant also respectfully requests that if any of the pending claims are not considered allowable in light of this Response, that the Examiner contact the undersigned Attorney-of-Record for a teleconference to resolve any outstanding issues.

Respectfully submitted,

Bingham McCutchen, LLP

Dated: 1/24/2005

By: 

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